

CLAIMS

- 1 A recombinant antibody capable of specifically binding to SAGA-1, said antibody comprising two peptide fragments of monoclonal antibody S19, or peptide mimetics thereof, wherein said fragments are covalently linked together by a linker, and said recombinant antibody containing less than 30% of the native S19 protein sequences.
- 5 2. The recombinant antibody of claim 1 wherein the linker is a peptide.
3. The recombinant antibody of claim 2 wherein the peptide linker is 5-20 amino acids in length.
- 10 4. The recombinant antibody of claim 1 or 2 wherein the peptide fragments have amino acid sequences of
a) SEQ ID NO: 1 and SEQ ID NO: 3, respectively; or
b) amino acid sequences identical to SEQ ID NO: 1 and SEQ ID NO: 3 but having 1 to 3 conservative amino acid substitutions in each of SEQ ID NO: 1 and SEQ ID NO: 3, respectively.
- 15 5. The recombinant monoclonal antibody of claim 4 wherein the recombinant monoclonal antibody is coupled to an effector molecule selected from the group consisting of toxins, virucides and microbicides.
- 20 6. The recombinant monoclonal antibody of claim 5, wherein the toxin is adenylate cyclase toxin.
7. The recombinant monoclonal antibody of claim 4 wherein the recombinant monoclonal antibody is coupled to a diagnostic label.
- 25 8. A nucleic acid sequence comprising sequences encoding the recombinant antibody of claim 4.
9. A composition, comprising as an active agent the recombinant monoclonal antibody of claim 1, in a pharmaceutically acceptable carrier.
10. The composition of claim 9, wherein said composition comprises a concentration of recombinant monoclonal antibodies sufficient such that one dose of said composition effectively binds 100 million sperm cells.
- 30 11. The composition of claim 9, wherein said recombinant monoclonal antibodies are present on the surface of liposomes.

12. The composition of claim 11, wherein said liposomes are non-phospholipid positively charged liposomes.

13. The composition of claim 12 wherein the recombinant monoclonal antibody is coupled to or formulated with, an effector molecule selected from the 5 group consisting of toxins, virucides and microbicides.

14. The composition of claim 13, wherein the toxin is adenylyl cyclase toxin.

15. A composition, comprising the recombinant monoclonal antibody of claim 1, immobilized on a solid support.

10 16. The composition of claim 15 wherein said antibody is covalently bound to said solid support.

17. The composition of claim 16 wherein the solid support is in particulate form.

15 18. A method of detecting the presence of sperm in a biological sample, said method comprising

contacting said sample with the composition of claim 15; and
washing the solid support to remove nonspecifically bound material.

19. A recombinant monoclonal antibody comprising an antigen-binding region of the S19 monoclonal antibody, wherein the antigen-binding region consists 20 essentially of two binding peptides covalently bound to one another by a peptide linker, said binding peptides having an amino acid sequence of

a) SEQ ID NO: 1 and SEQ ID NO: 3, respectively; or

b) amino acid sequences identical to SEQ ID NO:1 and SEQ ID NO: 3

but having 1 to 3 conservative amino acid substitutions in each of SEQ ID NO: 1 and 25 SEQ ID NO: 3, respectively, wherein said recombinant antibody is capable of specifically binding to SAGA-1.

20. ~~The recombinant monoclonal antibody of claim 19 wherein the peptide linker is 10-20 amino acids in length.~~

21. ~~The recombinant monoclonal antibody of claim 19 wherein the antigen-binding region has an amino acid sequence selected from the group consisting of SEQ ID NO: 8, SEQ ID NO: 11 and SEQ ID NO: 15.~~

22. The recombinant monoclonal antibody of claim 19 wherein the antigen-binding region has the amino acid sequence of SEQ ID NO: 8.
23. The recombinant monoclonal antibody of claim 19 wherein the antigen-binding region has the amino acid sequence of SEQ ID NO: 15.
- 5 24. The recombinant monoclonal antibody of claim 21 wherein the recombinant monoclonal antibody is coupled to, an effector molecule selected from the group consisting of toxins, virucides and microbicides.
- 10 25. A recombinant derivative of monoclonal antibody S19, said derivative comprising the biologically active fragments of antibody S19, or peptide mimetic thereof, wherein at least 75% of the original S-19 protein sequence has been deleted and the recombinant antibody retains its specificity for the SAGA-1 antigen.
- 15 26. The recombinant monoclonal antibody of claim 25 wherein the derivative antibody consists of SEQ ID NO: 1, SEQ ID NO: 3, and a linker that covalently binds SEQ ID NO: 1 to SEQ ID NO: 3.
27. The recombinant monoclonal antibody of claim 25 wherein the linker is a peptide.
- 20 28. A passive immunity composition for contraception, wherein the composition comprises the recombinant antibody of claim 1 in an amount sufficient to provide circulating titers of the antibody, in a patient requiring the same, that inhibit the ability of sperm to fertilize an egg.
29. A method of promoting contraception in a mammal, said method comprises administering the composition of claim 28 to a mammal in need thereof.
30. The method of claim 29 wherein the composition is administered intravenously.
- 25 31. A nucleic acid sequence comprising a single chain Fv fragment that consists of
SEQ ID NO: 2;
a nucleic acid linker; and
SEQ ID NO: 4,
- 30 wherein said linker is covalently linked to SEQ ID NO: 2 and SEQ ID NO: 4 such that expression of the nucleic acid sequence produces a functional Fv fragment.

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32. ~~The nucleic acid sequence of claim 31 wherein the single chain Fv fragment has the sequence of SEQ ID NO: 16.~~

33. ~~A nucleic acid sequence comprising a single chain Fv fragment selected from the group consisting of SEQ ID NO: 9, SEQ ID NO: 10, and SEQ ID~~

5 NO: 12.

34. The nucleic acid sequence of claim 33 further comprising regulatory sequences for expressing the single chain Fv fragment in a host cell.

35. ~~A host cell comprising heterologous DNA encoding a single chain Fv fragment selected from the group consisting of SEQ ID NO: 9, SEQ ID NO: 10 and SEQ ID NO: 12.~~

10 36. The host cell of claim 35 wherein the host cell is a bacterial cell and the DNA encodes a single chain Fv fragment comprising the sequence of SEQ ID NO:

17.

15 37. ~~A recombinant antibody derivative of monoclonal Antibody S19 wherein at least 75% of the protein sequence has been deleted and the recombinant antibody retains its specificity for the SAGA-1 antigen.~~